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36 — No. 2

RUARY, 1955

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February, 1955

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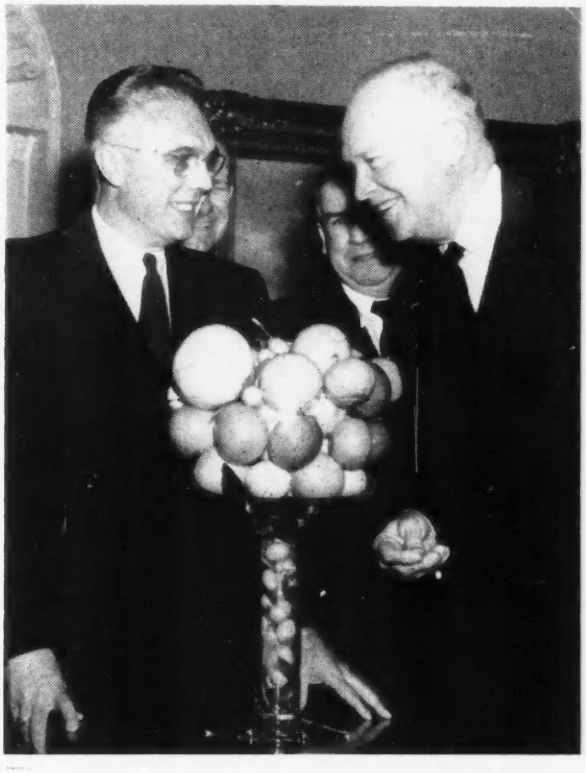

Frank D. Arn, director of merchandising for the Florida Citrus Commission, presents President Dwight D. Eisenhower a bowl of citrus fruits from California, Arizona, Texas and Florida. Arn, who is also chairman of the National Citrus Merchandising Committee, suggested that citrus fruits would aid the President in maintaining good health over the winter months. The presentation was made by the national committee to kick-off its winter promotion of citrus fruits for "Winter Health."

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R. M. Pratt

Citrus Insect Control

R. B. Johnson

For February 1955

W. L. THOMPSON,
R. M. PRATT
R. B. JOHNSON*
Florida Citrus Experiment Station, Lake Alfred

W. L. Thompson

The number of six-spotted mite infestations increased noticeably in December and January, and is considerably higher at this time than in previous years of heavy infestation. An increase on old leaves and watersprouts is expected during February, and infestations are expected to be severe in untreated groves during the post-bloom period.

Purple scale activity is at a low level and is expected to increase slowly in February. There may be some increase in hatching but the peak of the hatch is not expected until April. In some groves where scale was not controlled in the late fall, infestations are still heavy. At this time, 56 percent of the scales are in the adult stage, making satisfactory control difficult.

In January, red scale activity was the lowest since 1951. There will probably be an increasing trend in February but the general level of activity is expected to remain low. Over 50 percent of the scals are in the adult stage. The percentage of adults becomes this high only during cold winters.

Purple mite activity has been increasing steadily through January. A heavy spring population is expected as a result of the cold weather occurring during December. However, if abundant rains occur in the late winter or early spring, the infestations may be reduced. This may be illustrated by comparing the 1951 and 1953 seasons. The cold winter of 1951 was followed by a dry spring. Purple mite infestations increased almost continuously from early January through May, at which time the average infestation was heavier than at any time since. In 1953, the low winter temperatures were followed by abundant rains in late March and April. The purple mite population had reached a fairly high level in March, but declined rapidly through April and the spring peak reached during the dry weather in May was not particularly high.

In January, rust mite infestations were moderate on leaves, and low on the fruit. There will probably be some reduction in populations in February.

Mealybug infestations are expected to be heavier than normal this year.

SPRAY PROGRAM

Considerable young growth will probably be present in most groves by the first week in February. If the weather continues to be cold there may be some delay in new growth, but where there was rainfall in late January there will be new growth following a few days of warm weather.

Succulent growth is easily injured by most spray materials as well as by the force of the spray. Materials such as neutral compounds of copper and zinc, lime-sulfur, parathion and oil emulsion are usually considered safe but even they may cause injury to succulent foliage. Under no conditions should DN compounds be sprayed on succulent foliage. A 1% DN-sulfur dust is safer than a spray if it is applied uniformly, but it may also cause some injury. Unless it is very necessary, all spray operations should be kept to a minimum while the growth is succulent.

Purple and red scale control should now be delayed until the post-bloom period except where scale is causing severe damage. A high percentage of scale is in the older stages and thus difficult to kill and young growth is likely to be injuried. If control is necessary, parathion is safer than oil in relation to injury following cold weather. However, an application of either oil or parathion applied before growth starts will check heavy scale infestation.

Purple mites are likely to be more of a problem in February than scale. Mites can still cause heavy leaf drop and even though twigs may not die, the new growth will be weak and small. The safest materials to use for control are aramite and ovex. Both of these materials have been found to be fairly safe on succulent foliage but as stated above, any spray may cause mechanical injury to tender leaves. Aramite is used at 2 pounds per 100 gallons and ovex at 1 pound. Both materials can be combined with wettable sulfur but only ovex can be used with lime-sulfur. Lime-sulfur at ½ gallon per 100 gallons of spray is fairly safe on succulent foliage. Ovex should not be used more than once a year in the same grove because it has not been effective after two to three applications.

Six-spotted mites may be infesting young growth by the end of the month. Check new growth, especially grapefruit, when the leaves are about half normal size or larger. Both aramite and ovex are effective for control. Lime-sulfur at 2 gallons per 100 is also effective but should not be applied until the growth has hardened. The most important factor in six-spotted mite control is coverage of the under surfaces of the leaves.

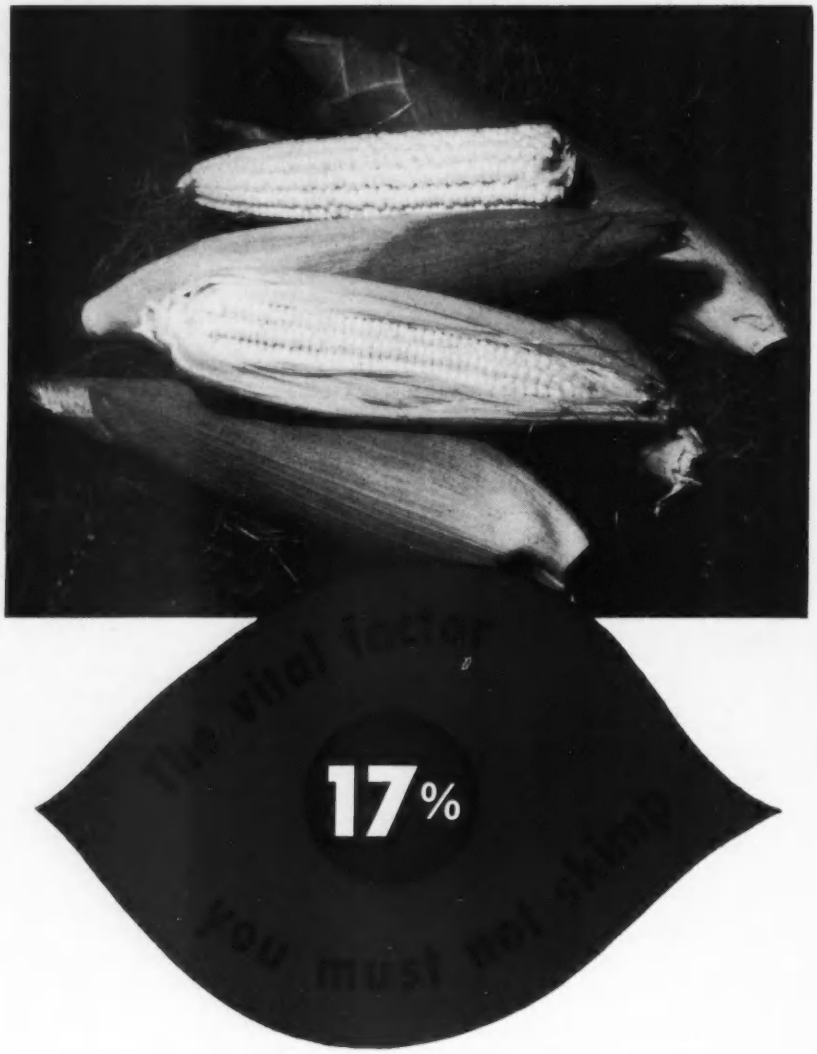
Rust mites can be controlled with either a wettable sulfur spray or a sulfur dust but the spray is most effective. Lime-sulfur at 1/2 gallon per 100 plus wettable sulfur can also be used but it should be remembered that any spray may injure foliage when it is very succulent.

Where compounds of zinc, copper, and manganese are necessary it will be well to wait until the post-bloom period or until the growth has hardened. However, where scab is a problem and a dormant copper was not applied, it is better to have some foliage injury than a severe infection of scab.

Aphid control may be necessary in some groves. If small colonies of aphids are scattered over the grove during early February or when the young growth is an inch to two inches long, then treatments should be made to prevent a heavy infestation and serious curling of leaves. If the grove is sprayed when only a few aphids are found the period of control will be much longer than where treatments are delayed. Control will be difficult if treatments are delayed until many of the leaves are curled.

(Continued on page 15)

*Written January 25, 1955. Reports of surveys by Harold Holtsberg, Cocoa; J. W. Davis, Tavares; K. G. Townsend, Tampa; J. B. Weeks, Avon Park; and T. B. Hallam, Lake Alfred.



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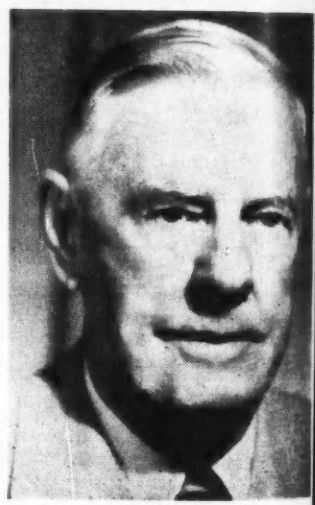
Minton Resigns; Michael Succeeds

O. C. Minton, Fort Pierce, recently resigned as a member of the Florida Citrus Commission of which body he was formerly chairman. He has been succeeded by A. B. Michael, Wabasso.

O. C. MINTON
Long Prominent in citrus circles of the Indian River section



A. B. MICHAEL
Owner of the celebrated Deerfield Groves and for nearly half a century a leader in Florida citrus circles.

Mr. Michael will fill out Mr. Minton's term on the Commission which expires in June. Both men have long been recognized as among the most prominent and active leaders of the industry.

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Commercial production has just begun another modern food miracle—the ultimate in fresh fruit juice concentration—orange and grapefruit juice concentration in dry crystals, to which only water is added to reconstitute it comparable in taste, appearance, aroma and nutritive value to the fresh product.

The new orange and grapefruit crystals eliminate the need for frozen processing and storage. The dry crystals keep on the shelf in ordinary temperatures, retaining the fresh-tasting flavor and 96% of the Vitamin C content of the fresh fruit.

It was primary these factors which promoted the military during World War II to spark research into fruit dehydration, first through the Massachusetts Institute of Technology and later through the U. S. Agriculture Department. Though failing to discover a satisfactory commercial process then, this research did lead to the early postwar development of the familiar frozen juice concentrate as an alternative.

Following additional years of industry and government research, it subsequently fell to a private firm long experienced in the dehydration of deciduous fruit products, the Vacu-dry Co. of Oakland, California, to perfect and patent the commercial process for producing dry citrus crystals.

This perfected process can retain the flavor and nutritive values of the fresh fruit juice by removing the moisture quickly under an extremely high vacuum, in the absence of air, with heat applied quickly and closely-controlled.

The first commerical processing plant began commercial output recently in the Florida citrus belt, at Plant City, Florida, and is operated by Orange Crystals, Inc., in association with Vacu-dry technicians. The $350,000 plant began commercial output recntly at the rate of 2,000,000 pounds of crystals a year, or the processing equivalent of 15,000 fresh oranges an hour the year round without seasonal shutdowns. Additional processing units will be built throughout 1955 and following years.

Spuds Johnson says biological warfare is not new — Nature has been waging it against crops and livestock for a long, long time.

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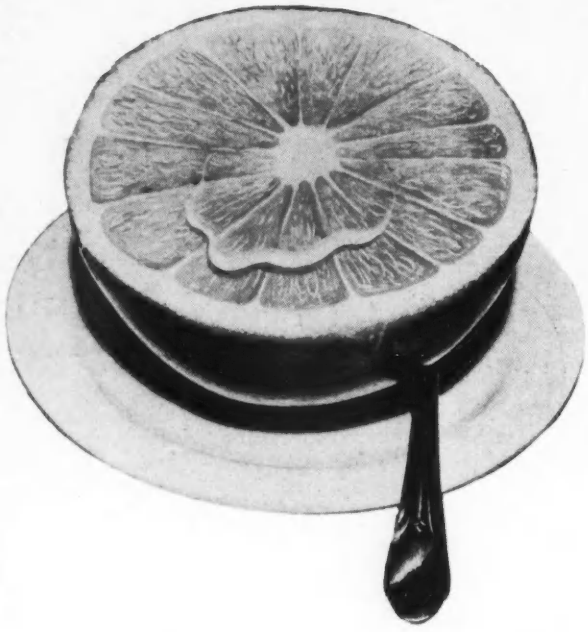

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A Survey On Recovery Of Citrus Glucosides

R. HENDRICKSON

FLORIDA CITRUS EXPERIMENT STATION, LAKE ALFRED

AT MEETING OF FLORIDA STATE HORTICULTURAL SOCIETY

J. W. KESTERSON

The principle glucosides of oranges and grapefruit—namely hesperidin and naringin, respectively—continue to be the outstanding possibilities for increasing profits from citrus by-products. Characteristics and uses of the two glucosides have been reported previousely by the authors (4, 8). Under the existing commercial processing technique of handling waste citrus peel, the possible methods of recovering these glucosides fall into four categories: (a) extraction from chopped, undried citrus peel, (b) separation from citrus press liquor by extraction or crystallization, (c) extraction from dried citrus pulp and (d) extraction from citrus molasses. This report is mainly concerned with the first possibility, extraction from chopped undried citrus peel, and is an amplification of previous reports (4, 8) on the distribution of hesperidin and naringin in citrus.

Three pertinent patents exist (2, 5, 7) for the separation of hesperidin and two patents (1, 6) for the recovery of naringin. Each embodies the same principle of using alkali to dissolve the glucoside in a liquor which is later separated from the peel and acidified, whereupon the glucoside crystallizes out. These patented procedures were evaluated over a wide range of conditions to determine which process gave the most consistently high yields of glucoside. Following the best of these procedures, a survey was made to appraise some of the other factors affecting yield which would be of interest to the industry. Included among these factors studied were fruit maturity, variety, size of peel, and re-use of the extraction mother-liquor.

Recovery of Hesperidin

Three varieties of oranges were investigated, so chosen as to represent early, midseason and late fruit. The trees used for this study received standard fertilizer and spray practices, and were all on rough lemon rootstock. Each sample comprised one bag of fruit, which was picked from numerous locations on the tree so as to be as representative as possible.

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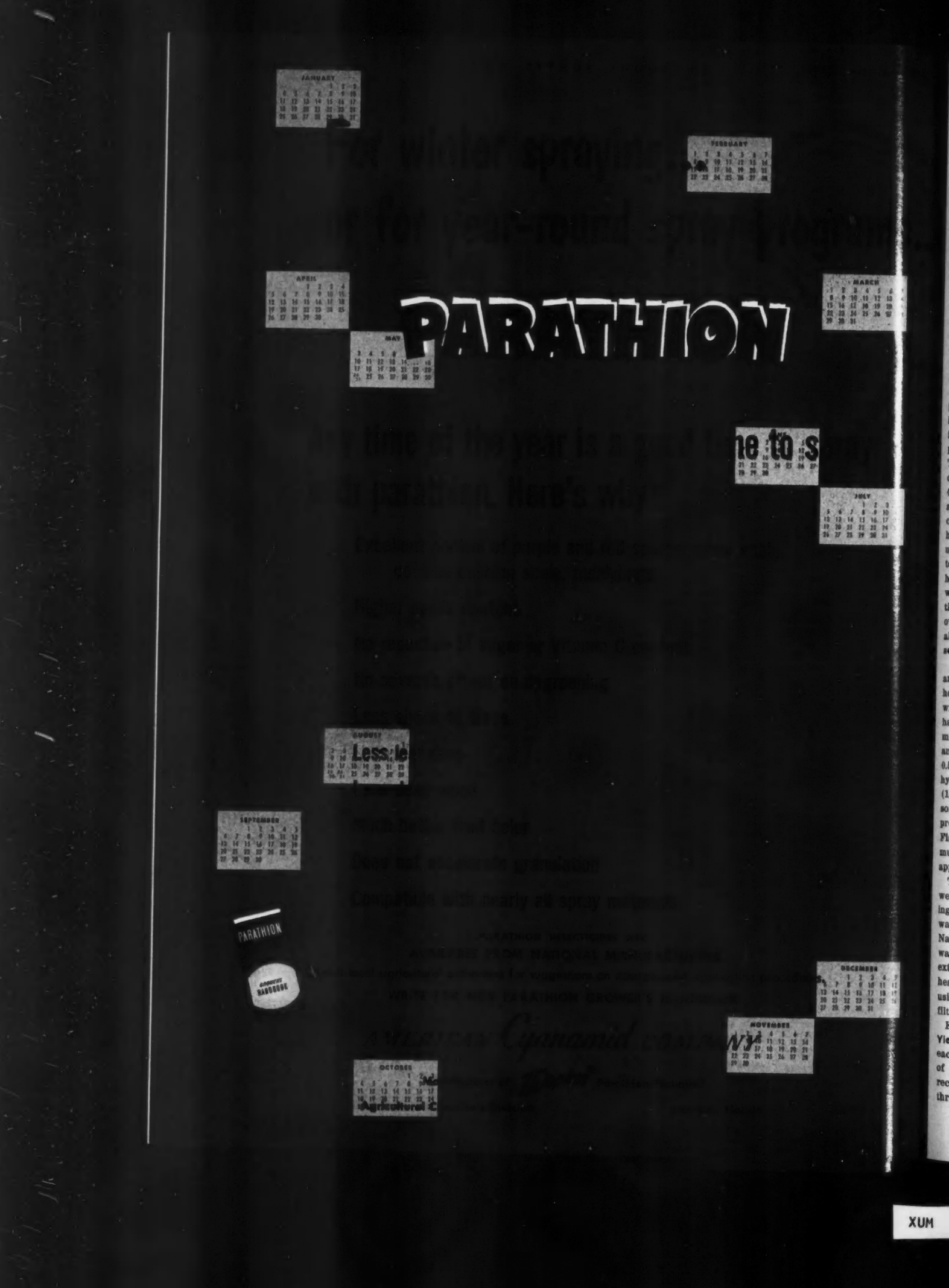
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A SURVEY ON RECOVERY OF CITRUS GLUCOSIDES

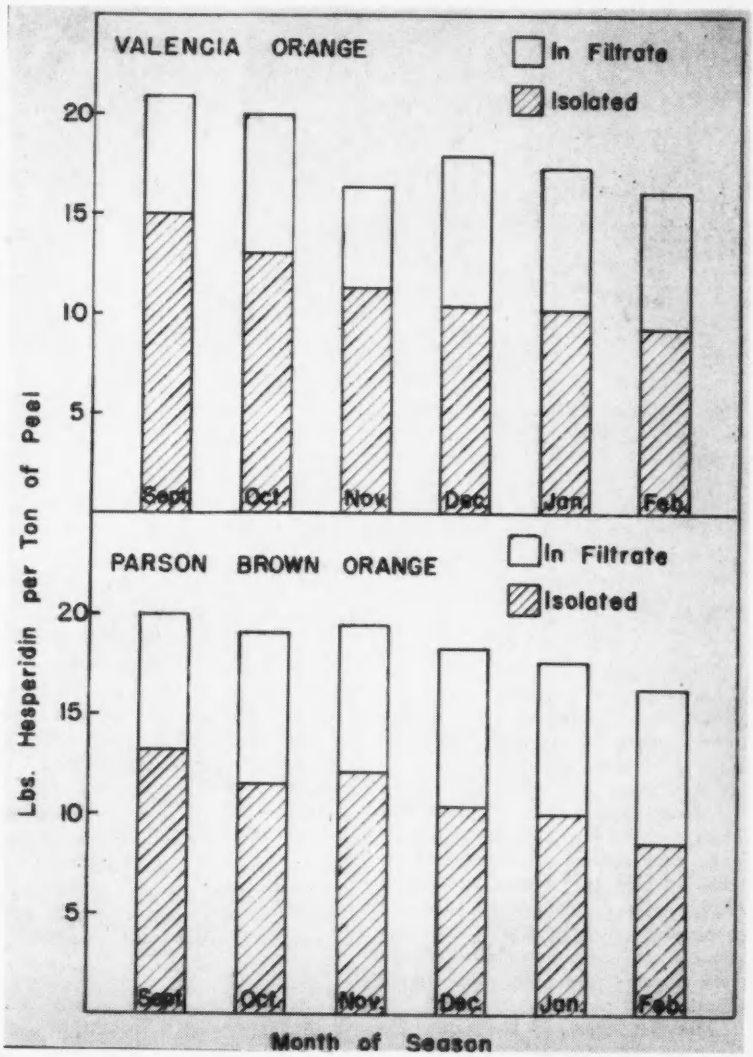
(Continued from page 7)

Method of Recovery.— The procedure for extracting hesperidin from the orange peel was as follows. The fruit was juiced in a Citro-Mat extractor with a roll pressure of 65 lb. sq. in. The peel was suosequently chopped in a Fitzpatrick comminuter so as to pass a screen with 1/4 inch holes. A 4000 gram sample of the finely chopped peel was weighed into a 6 gallon pail and 6000 grams of water added. The mass was continually stirred mechanically over the next 90 minutes while enough calcium hydroxide was added in portions to maintain the ph at approximately 11.0. After this period of time, the peel slurry was strained through one layer of cheese-cloth and the remaining peel pressed to an equivalent pressure of 300 lbs. per square inch. The turbid press juice was collected, combined and the pH adjusted to 4.7 with concentrated hydrochloric acid. Thirty grams of strained Supercel were added and the entire sample heated to 55-60° C. and maintained under agitation for 90 more minutes to complete the crystalization of hesperidin. The next day the sample was decanted and the remaining portion filtered. The filtercake was dried overnight at 80° C., weighed and an aliquot analyzed. The filtrate was separately analyzed.

Method of Analysis.— The extracts and samples were analyzed for hesperidin by the Davis method (3) with the following modifications. One-half ml. of extract was added to 24 ml. of 90 percent diethylene glycol and the increase in color by adding 0.5 ml. of approximately 4 N. sodium hydroxide was read after 30 minutes (15 minutes for naringin). Comparison made against a standard curve prepared from data obtained with a Fisher Electrophotometer and a 425 mu filter. All readings were made at approximately 25° C.

The hesperdin filtercake samples were analyzed by grinding and weighing a three gram aliquot sample which was then slurried in 1 liter of 0.2 N. NaOH for 5 minutes. The sample was then filtered and 0.5 ml. of this extract analyzed. The filtrates of the hesperidin isolation were analyzed using a 0.5 ml. of the double-diluted filtrate.

Effect of Maturity of Fruit upon Yield.— Samples of fruit were picked each month to investigate the effect of maturity upon yield of hesperidin recovered from the peel. Each of three varieties were picked and studied from before-maturity to over-maturity. Parson Brown oranges were picked from September through February; Pineapple oranges from September through March; and Valencia oranges from September through May. The results of this survey, shown in Figs. 1 and 2, would indicate that the best yields of hesperidin are obtained by processing oranges at the earliest possible date. These data show an average decrease in yield of one pound of hesperidin per ton of peel for each month of greater maturity. A further effect of greater fruit maturity was a noticeable decrease in the purity of the isolated hesperidin. The isolated hesperidin samples were usually about 65 to 67 percent actual hesperidin in September, with the ballast material increasing each month until the samples in February and March were about 42 to 45 percent hesperidin.

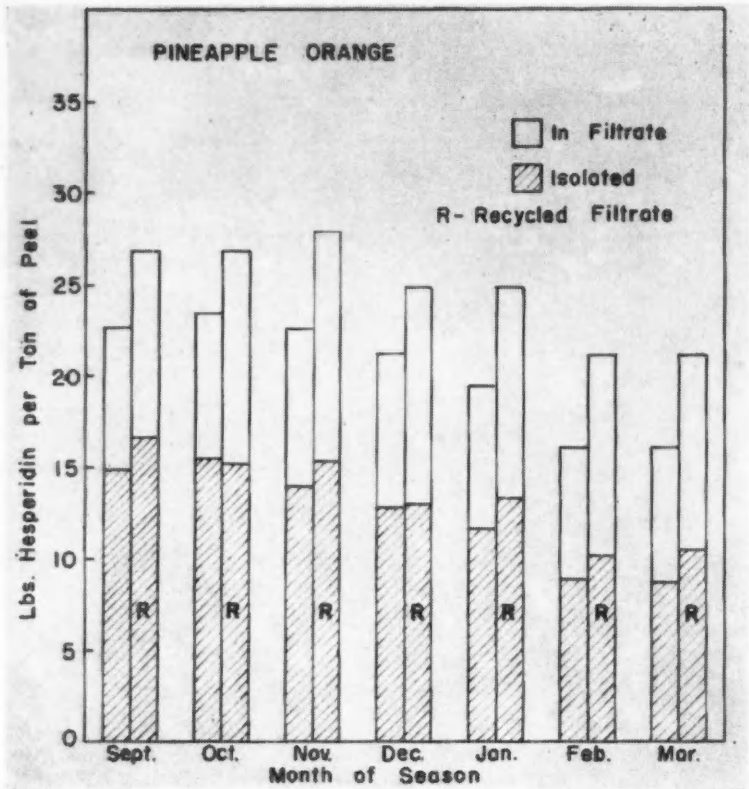


Effects of Variety upon Yield.— Of the three varieties studied, Pineapple oranges were found to yield the highest quantity of hesperidin. Comparison of Fig. 1 with Fig. 2 shows Valencia to be the second choice, provided the three varieties were procesed on the same day and before February. If, however, these varieties are processed individually on their earliest respective maturity dates then the varietal order for best hesperidin yields is Pineapple, Parson Brown and Valencia.

Effect of Particle Size upon Yield.— Preliminary evaluation of hesperidin recovery methods indicate that yield was influenced by particle size of the peel. To verify this, a larger sample of Valencia oranges was picked in November and the peel divided into three portions which were individually comminuted in the Fitzpatrick mill through screens having one-quarter, one-half and three-quarter inch holes. The respective yields of hesperidin

XUM

from these three samples were 12.4, 11.3 and 10.2 lbs. per ton of peel. Thus it was shown that yield was influenced by the size of the peel. Although a 20 percent increase in yield could be obtained by using the one-eight, rather than the three-quarter screen, there would be certain disadvantages in commercial operation, such as increasing the quantity of fines in dried citrus pulp. These would have to be evaluated by the processor.



In this survey all samples were chopped to pass the one-quarter inch screen from September through November after which a half-inch screen was used since difficulty was encountered chopping the more mature, soft peel.

Effect of Recycling Hesperidin Extracting Liquor.— Noticeable in Fig. 1 is the high concentration of what appears by the Davis (6) test to be hesperidin in the filtrate of the hesperidin isolation procedure. It was reasoned that this filtrate would serve as an excellent extrating medium for subsequent runs since it was already well saturated with hesperidin and thus would reduce the extraction loss in the new lot of peel. A further advantage in using the filtrate rather than water would be a reduction in the volume handled and the maintaining of higher sugar concentration thus simplifying later use or disposal of the liquid. The quantity of hesperidin-like material lost in each isolation filtrate throughout the season is shown in Figs. 1 and 2. There actually seemed to be a rather constant amount of from six to eight pounds per ton of hesperidin-like material that was lost in each run. This amounted to approximately 0.18 percent hesperidin by volume in the filtrate, which is greater than the normal solubility of hesperidin in water.

Each extraction of Pineapple orange peel was repeated under identical conditions except that the filtrate from one hesperidin isolation was used to replace the make-up water of the next extraction. The overall seasonal effect of recycling the extracting liquor was an increase in yield of approximately 10 percent as shown in Fig. 2. The better yield was accounted for by the fact that the concentration of hesperidin-like materials in the isolation filtrate increased only slightly when recycled. In actual practice the industry might find it equally advantageous to use citrus press liquor from the feed mill as the extraction liquid.

Miscellaneous Data of Survey.— The chemical requirements, maturity of the orange juices, processing dates and other results are shown in Table 1. From these data it will be noticed that an average of 30 lbs. of hydrated lime is required per ton of peel processed. An even greater quantity of lime (25 percent more) is required when the extraction liquor is recycled. The quantity of hydrochloric acid (37 percent strength) needed for neutralization averaged 18 lbs. per ton of peel processed and was only roughly proportional to the quantity of lime used. An average of 50 percent more acid was required to neutralize the recycled extraction liquor. The cost for these two chemicals would amount to 8.4c per lb. of hesperidin produced, provided a yield of 10 lbs. hesperidin per ton of peel could be obtained.

Recovery of Naringin

The recovery of naringin from grapefruit was surveyed similarly throughout one season. Following the general

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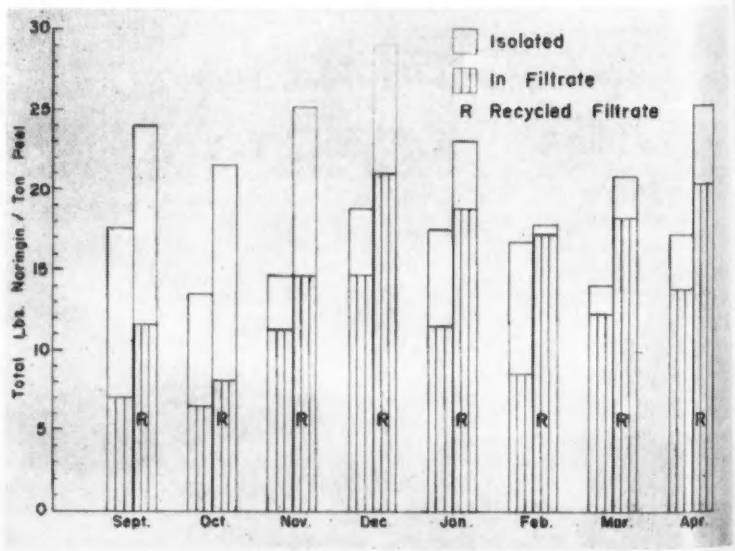


"Spreading Decline" Of Citrus Continued

Practical Aspects And Cost Of The "Pull And Treat" Method

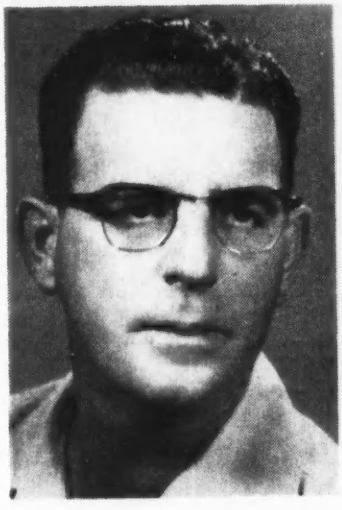
When Spreading Decline is found in a citrus property it is indeed bad news for the owner as well as owners of surrounding groves. We have experienced what will result if nothing is done to Decline infected areas. One 30-acre block that is in our organization went out of economic production in less than ten years. This was a corner penetration and not a center attack.

After Spreading Decline has been established the next move is having the property charted as to degree of infestation or number of trees affected, and number of trees in the buffer areas or, in short, where and how many trees are to be removed.

With this information the owner is approached and the situation thoroughly discussed. The owner is informed that the "Pull and Treat" method has proven eighty per cent effective, or that eighty per cent of infected areas so treated have proven to be free of the nematode.

After the owner has given reluctant consent to pull the trees and treat the soil the next job is to properly mark trees to be removed. Then a bulldozer is engaged to push out the trees that are marked for removal. The fruit on these trees is salvaged when possible before the trees are removed.

About four trees are pushed out, a fire is started in the center of this area usually with used tires and waste oil. Trees are pushed together over this fire by the bulldozer, and it looks like a mushroom as new trees are added to the fire and pushed to the lower center of the fire. The



MORTY HOWELL
WAVERLY CITRUS GROWERS,
WAVERLY, FLORIDA

AT MEETING OF FLORIDA STATE HORTICULTURAL SOCIETY

fire is constantly fed more trees and sometimes burning is accentuated by the use of bellows. This is made by old duster blower and a few joints of old irrigation pipe.

After the trees are removed and burned the dozer blade, equipped with teeth resembling a fork, rakes the area to bring to the surface all roots possible. Then labor is employed to remove all roots showing.

A new ground plow is then employed to bring to the surface roots missed in the previous operation. Again roots are picked up and burned. The emphasis on the roots has a dual purpose. One purpose is to eliminate many infected roots and the other is to insure a better fumigating job.

After plowing and picking up of roots the area is disked, roots picked up and the ground leveled by a drag of some sort. Now the land is ready for fumigating.

The soil fumigant used is a liquid-D-D (Dichloropropylene-Dichloropropane). This is applied with a mechanical applicator at a depth of fourteen inches. The ejector is behind a shoe trailing a 36-inch coulter. The fumigant is emitted by pressure to obtain constant and uniform application.

After two months the property is ready to be planted. The following are approximate costs when all operations are contracted for and the owner has neither men nor equipment to do the job:

Operation	Cost per acre
Removing and burning trees, and raking ground	$140.00
Picking up roots, plowing, disking and leveling ground	50.00
Fumigant at 600 lbs. or 60 gals. per acre ($1.65 per gal.)	99.00
Application of D-D (35c per gal.)	21.00
Trees and planting	140.00
Total	$450.00

True it is cheaper to buy new land and plant; however, if Spreading Decline is discovered when only a few trees are affected the "Pull and Treat" method is not too costly.

Resistant Rootstock Studies Using The Temperature Tank For Screening

R. F. SUIT

The final answer to the problem of controlling the burrowing nematode will almost certainly lie in one of two fields of effort. One is the finding of a tolerant or resistant rootstock which is commercially useful and which can be used for replanting, and the other is the use of a chemical treatment, applied either to the soil or the tree, which will either kill the nematodes or make the tree roots distasteful to it. Since these are the logical fields of research as far as a real answer is concerned, much of the work at the Citrus Experiment Station is being concentrated in these fields and in related fields of fundamental research on the nematode which may furnish useful aid in the practical work. While no answers are available in these fields, the succeeding discussions will give an idea of the work in progress. This discussion will deal with work on rootstocks.

The best way to control a nematode is to use a resistant or immune variety

of the crop being grown while in citrus this line of attack would apply to the rootstock. The information on nematode susceptibility of the different species of citrus is rather meager. DuCharme (2) reported in 1948 that **Poncirus trifoliata** (Linn.) Raf. was markedly resistant to the citrus nemetode **Tylenchulus simipenetrans** Cobb. Later Cameron, Baines, and Clarke (1) showed that a number of hybrid seedlings of trifoliate orange were also resistant to the citrus nematode although none was immune.

The common rootstocks, rough lemon, sour orange, grapefruit and sweet orange, are all susceptible to the burrowing nematode **Radopholus similis** (Cobb) Thorne. If a rootstock could be found that was highly resistant or immune to the burrowing nematode, it would be of extreme importance in the control of Spreading Decline. The usual procedure of planting young trees budded on various types of rootstocks in Decline areas will give results but it would require two to five years before any clear indication of resistance of susceptibility could be obtained.

In the inoculation work in the temperature tanks where the soil temperature is maintained at a temperature of 75-78 F., which is very favorable to the nematodes, it was noted that a stunting effect was evident within six weeks when seedlings were planted in infested soil. After three months, definite differences were noted and the population of the burrowing nematode in the seedling roots was high. This makes it possible to screen rootstocks

(Continued on page 14)

R. F. SUIT
FLORIDA CITRUS EXPTR'MENT STATION, LAKE ALFRED
AT MEETING OF FLORIDA STATE HORTICULTURAL SOCIETY

Table 1
Some Temperature Tank Results on Susceptibility of Citrus Seedlings to the Burrowing Nematode

Kind of Citrus	Months Tested	Average Height		Average Number Nematodes per Root Sample*
		Normal Subsoil	Infested Subsoil	
Natsumikan	3	12.5	6.0	501.5
Siamese Pummelo No. 10044	3	11.0	5.5	493.5
Sperryola X Philippine lime	3	11.0	5.0	599.5
Warnuco	3	10.5	4.25	98.0
Ichang lemon	3	10.75	4.5	198.1
Poncirus trifoliata	12	36.0	25.0	452.9

* Taken at end of experiment on plants growing in infected subsoil; the plants grown in healthy soil showed no infestation.

Field Experimental Work With Root-Stocks And Its Limitations

The writer has been working on the field aspects of the rootstock problem. Dr. Suit has already discussed the use of the soil temperature tank for the screening of rootstocks. This work must be parralled with field experiments designed to determine resistance in the field and also in case of unknown stocks, something of their horticultural value.

Fifty-two species and varieties of citrus have been budded to Valencia oranges in the nursery at the Citrus Experiment Station. Three of these were planted in commercial groves in nematode infested soil in 1951, 12 in 1953, and the remainder will be planted in 1955. The stocks included citranges, mandarins, tangelos and numerous species. After two years in the field, the feeder roots of the various rootstocks wil be checked for nematode damage. Stocks that show promise in their resistance to burrowing nematode damage will have to be evaluated for their diseases, suitable tree growth and fruit characteristics. Many of the stocks planted before screening may be eliminated by the results of seedling tests in the temperature control tanks.

HARRY F. FORD
FLORIDA CITRUS EXPERIMENT STITION, LAKE ALFRED
AT MEETING OF FLORIDA STATE HORTICULTURAL SOCIETY

In addition to trying new rootstocks, a search has been made for trees in Spreading Decline areas that appear tolerant to attacks by the burrowing nematode. This has been in progress for several years. Seven trees have been found that looked healthy while surrounded by Decline trees. Two of these have been eliminated from the tolerant list because of obvious feeder root damage by the nematode.

The root system of citrus can not be propagated readily by cutting and considerable work was necessary to find a suitable method of propagating the roots of trees suspected of being tolerant to Spreading Decline. The present system consists of obtaining leafy shoots on cut roots turned up under the tree and then propagating the leafy shoot as leaf bud cuttings. A plant, suitable for testing in the temperature tanks, can usually be obtained in 6 months after roots are cut on the test tree. These plants will

(Continued on page 15)

Research On Non-Pythotoxic Chemical Treatments For Soil Treatment

R. F. SUIT
FLORIDA CITRUS EXPERIMENT STATION, LAKE ALFRED

AT MEETING FLORIDA STATE HORTICULTURAL SOCIETY

A nematocide that is nontoxic to plants and which can be applied to the soil around a plant for nematode control is the dream of all workers and growers confronted with the type of problem we have here. In the case of citrus, such a material should not be taken up and translocated into the fruit unless it is nontoxic to humans; be applicable to the soil without disturbing the roots; penetrate the soil to a depth of eight to 10 feet; and persist in the soil for a long period of time. This is a large order but the rewards could be high, and research workers of many chemical companies are actively engaged in the research. As a result, new compounds are being developed constantly for field trial. In the research work at the Citrus Experiment Station, various chemicals and materials have been applied to the soil around citrus trees for a number of years to determine if any of them would be of value for the control of the burrowing nematode, **Radopholus similis** (Cobb) Thorne.

During 1945 to 1947, the soil around a total of 1198 trees was treated with varying amounts of nine chemicals. For example, as much as 60 pounds of ammonium sulfate, 100 pounds of sulfur, 50 pounds of hydrated lime, or 40 pounds of rock salt was applied per tree in some of the early experiments. In no case was there a beneficial or detrimental effect from any of the treatments.

In 1948, it was considered that some of the new organic insecticides might be nematocidal. The soil in duplicate plots of four trees each was treated with parathion (25 percent wettable) at three and five pounds, benzene hexachloride (6 percent gamma isomer) at three and five pounds, and chlordane (25 percent wettable) at three, five and 10 pounds per tree. Immediately after the materials were applied, the soil was thoroughly disked. Although there was excellent weed control in the benzene hexachoride plots for eight months, there was no growth response by the trees in any of the plots.

Since groves are commonly irrigated in Florida, it might be possible to inject a material into the irrigation line for application to the soil. To simulate this condition, 500 gallons of an emulsion of each of several materials was applied to the soil around a total of 69 trees during the summer of 1948. Shell D-D, Dowfume N, and Dowfume W-85 were used at 500 ppm. which is relatively nonphytotoxic. In one experiment D-D and Dowfume W-85 were applied three times each at monthly intervals. Although nematode counts showed as much as a 70 percent reduction in total population by some of the treatments, there was no beneficial effect on the growth of the trees.

The question has been raised several times as to the value of added organic matter for the control

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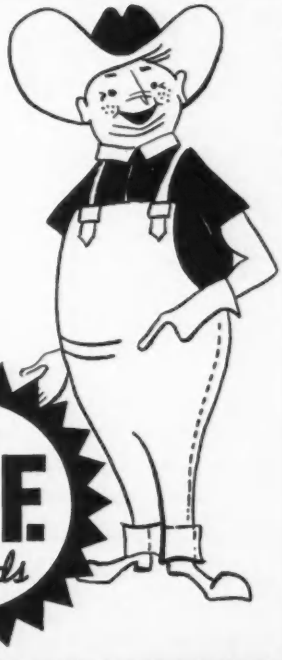

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of Spreading Decline. In 1947 and 1948, eight-inch mulches of sawdust and water hyacinths were maintained around a total of eight trees without any improvement in their growth. During 1950 and 1951, 12 trees in each of four groves received 25 pounds of a ground peat mixture per tree three times each year in addition to the regular fertilizer program. This was worked into the soil with a Rototiller. Negative results were obtained. In 1951 and 1952, a grower used tobacco stems on his acreage of Spreading Decline but had no tree response from the applications. Cold Smoke, a mixture of ground tobacco stems and barium sulfide, was used at the rate of 100 pounds per tree on a block of nine trees in June, 1953. This treatment did not control the burrowing nematode.

As the chemical companies began to come up with new nematocides, experiments were started with these new materials. These treatments have been made in three ways: applied to the soil as an emulsion or solution; injected by machine; and injected by hand. Two applications, three months apart, of sufficient Nemakril emulsion to equal 40 gallons of toxicant per acre did not control the burrowing nematode or cause injury in the block of nine trees treated. N-869 was phytotoxic where an acre-foot of a 200 ppm. solution was applied, and with a six-inch application there was some root damage. When used at a concentration of 100 ppm. at rates of 6 acre inches and 12 acre inches root damage also was produced. No apparent damage occurred with concentrations of 25 and 50 ppm. While all treatments produced a significant reduction in nematode population at the 18-inch and four-foot levels sampled, the control was not satisfactory and no tree response was obtained.

In the machine injection experiments, D-D, Dowfume W-85, OS-1897, V-C 1-13, DCB-40, and N-339 are under test. In the row treatment experiments, the width of the treated strip in the middles varies from four feet to 20 feet. With the 20-foot strip there is some tree defoliation but they will apparently recover. In another experiment the treatments are being made in April, June, October and January to determine if the time of year is a factor. In one strip experiment, applied in April 1954, OS-1897 at 10 galons per acre gave better nematode control than D-D at 100 gallons or Dowfume W-85 at 25 gallons 2½ months after treatment of the middles between the rows of trees. However, no response in tree growth has been noted to date.

Of the new materials, OS-1897 and V-C 1-13 appear to have more promise than the others for possible non-phytotoxic treatment of trees. In an experiment with these materials, 2500 square feet of soil around each tree is treated by hand injection at one foot intervals. OS-1897 is being used at the rate of 2.5, 5, 7.5, and 10 gallons per acre while V-C 1-13 is being used at 15, 30, and 60 gallons. This experiment is in progress and no results are available at this date.

It should be remembered that up to the present time no one has come up with a treatment for trees in place. For this reason, experiments along this line have no guide posts. For this reason, the over-all picture is not too promising though the companies are constantly producing new chemicals and one of these may succeed. California, in a limited experiment, has indicated a favorable reaction to strip treating for control of the citrus nematode. It is doubtful, however, if the row treatment will be effective on the burrowing nematode as it is one of the migratory endoparasitic forms and moves from root to root while the citrus nematode moves very little. The burrowing nematodes would probably reinfest any treated strip of soil nearly as fast as the roots grew back. This might not necessarily be true if the nematocide would remain in the soil for a time and was not toxic to the plants. When emulsions or solutions of materials are used there is a tendency for many materials to be filtered out and absorbed by the soil which limits the depth of penetration. At present, OC-1897 and V-C 1-13 can be considered as possibilities. Both of these will persist in the soil for a period of time. OS-1897 is known to retard root growth, but how long or at what dosages citrus will be affected is not known. To treat under the trees without disturbing the root system, it is necessary to use hand injectors for experimental work but they would not be suitable for practical work and machinery would have to be developed.

While soil treatments with the trees in place have not shown results to date, this work is being pushed strongly as one of the possible final solutions.

RESISTANT ROOTSTOCK STUDIES USING THE TEMPERATURE TANKS FOR SCREENING

(Continued from page 12)

rapidly by planting seedlings of various rootstocks in the temperature tank and thus obtain in a short time information on their susceptibility.

The first test with seedlings was started in June 1954. One seedling of each type of citrus to be tested was planted in each of six cans of infested subsoil and six cans of normal subsoil. After three months the seedlings were measured to determine the amount of growth and a root sample from each seedling was examined by root incubation for the presence of **R. similis.** The results of this test are presented in Table 1. In no case was **R. similis** found on seedlings growing on normal soil. It was the only parasitic nematode found in the roots of the seedlings or in the infested soil in the cans. It will be noted that all of the five kinds of citrus are susceptible to the burrowing nematode. Twelve of the seedlings of **Poncirus trifoliata** that had been in another experiment for 12 months were also examined. As noted in Table 1, this type of citrus is also susceptible. A total of 18 other kinds of citrus are being tested now and results on these should be obtained by the end of the year. The temperature tank procedure is a reliable and rapid way to test the seedlings.

Any kind of citrus that could be used as a rootstock and that is

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immune or free of **R. similis** under the optimum conditions in the temperature tank would be preferred. If such can be found it will be budded and tested for virus resistance and horticultural characteristics as rapidly as possible. It may be, however, that some of those seedlings which show susceptibility in the temperature tank test would show some resistance under field conditions though still a host for burrowing nematode. Consequently, all plants tested will be watched for signs of limited susceptibility or ability to outgrow the nematode and all these will also be field tested. Space is limited in the tanks but their capicity will be increased as soon as possible.

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1. Cameron, J. W., R. C. Baines, and O. F. Clarke. 1954. Resistance of hybrid seedlings of the trifoliate orange to infestation by the citrus nematode. Phytopath. 44: 456-458.

2. DuCharme, E. P. 1948. Resistance of **Poncirus trifoliata** rootstock to nematode infestation in Argentina. Citrus Indus. 29(7): 9, 15.

CITRUS INSECT CONTROL FOR FEBRUARY, 1955

(Continued from page 3)

One pint of nicotine sulfate plus 3 quarts of an oil emulsion is an effective aphicide combination and will also control purple mites. Tetraethyl pyrophosphate (TEP) and parathion are also effective aphicides but should not be used with lime-sulfur or other sprays containing lime. Apply the TEP according to the manufacturer's recommendations. Parathion is effective at 1 pound per 100 gallons.

For more detailed information refer to the 1955 "Better Fruit Program" or consult the Citrus Experiment Station at Lake Alfred or Fort Pierce.

Less Fertilizer, More Plant Food Used In 1953-54

American farmers used a slightly smaller tonnage of fertilizer in the year ending July 1, 1954, than in the previous 12 months, The National Fertilizer Association announced here today.

Association officials point out, however, that consumption of the plant foods — the active ingredients in fertilizer — probably was somewhat greater in 1953-54 than during the previous year, thus setting a new all-time record. This is because of the trend toward greater availability of materials containing a higher concentration of the plant food elements.

Total consumption in the United States of all kinds of fertilizer during 1953-54 was 20,290,549 tons as compared with 20,603,448 tons in 1952-53. This represents a decrease in tonnage of 1.5 percent.

The apparent leveling-off of fertilizer consumption this year is attributed by the Association to various factors including drought over wide areas of the country, planting restrictions on major crops, and reduced farm income due to lower prices for farm commodities.

FIELD EXPERIMENTAL WORK WITH ROOTSTOCKS AND ITS LIMITATIONS

(Continued from page 12)

be tested for resistance in both the tanks and the field. All appear to be lemon but a little different from rough lemon, which was the stock in the groves where the trees were found.

Aphids (plant lice), common on the young, tender growth of many plants, particularly in the spring, can be controlled easily by spraying with nicotine or dusting with malathion.

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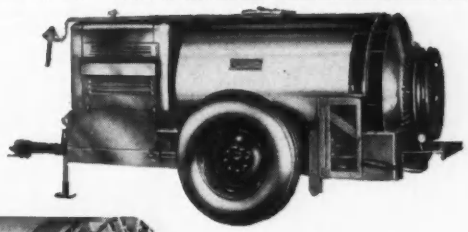

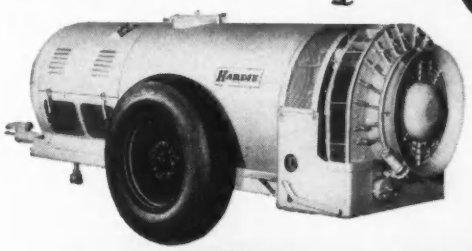

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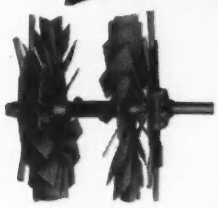

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Notes Of The Trade

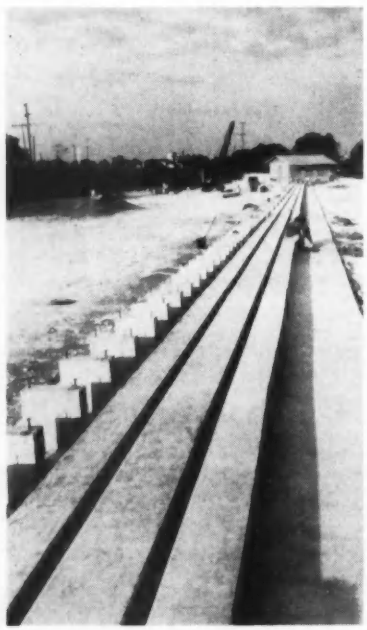
New Structures For The Citrus Industry

HENRY H. EDWARDS

The citrus industry will soon be able to purchase revolutionary new prefabricated concrete buildings. These buildings are to be made in five concrete prestressing plants now being set up within shipping distances of the citrus belt.

Prestressing is a new development in concrete that enables the concrete to become very strong, resilient, flexible, and practically crack free. It also provides long clear spans of 40 to 60 feet previously considered impossible with concrete design.

The typical prestressing plant under construction is installing a 400 foot long casting form made of steel and



concrete to produce a roof and floor slab. This prestressed slab in cross section looks like two large Tees side by side. It is commonly called a Double Tee. This concrete slab is 2 inches thick, 4 feet wide, and can be made in lengths up to 44 feet. The depth of the stem is varied from 2 inches to 12 inches, depending on the length of span and loading required.

A seven wire small diameter strand (similar to a cable) is used as the prestressing steel in place of the conventional reinforcing steel. This is located in the stems. This steel is pretensioned in the forms with a pull of 14,000 pounds on each strand. This pretensioning actually stretches the steel 30 inches in the 400 foot long bed. A high strength concrete is poured into the forms and bonds to the steel. After an overnight curing at 145 F, the concrete has reached 4000 pounds per square inch compressive strength and may be removed from the molds. These large slabs are ready to be shipped and erected the day after casting.

In addition to the roof and floor slab, these yards will make wall panels, columns, and beams.

The citrus industry stands to benefit from this new construction through longer spans, lower maintenance, low fire insurance, and better sanitation.

Prestressing requires about one half the concrete and one-fifth the steel usually required for reinforced concrete. These material savings, plus the inherent advantages of central plant precasting, will result in low prices previously impossible for all concrete construction. Within a few months, one of these new prestressing plants will offer to the citrus industry an all concrete warehouse of high ceilings and long spans which can be erected for $3.00 to $3.50 per square foot of floor area.

New Use For Citrus Meal

Citrus meal, long valuable as a cattle feed, now is being used by American Cyanamid Company in a new role—as an important element in a drug preparation which prevents coccidiosis in poultry. The improved blend of the drug, Megasul 25% Nitrophenide, is now available to feed manufacturers for use in premixes and poultry feeds, according to Cyanamid Company officials here.

The special grind citrus meal was developed by the Cyanamid Process Development Laboratories as a carrier for the Nitrophenide. The porosity and free-flowing characteristics of the meal were found to be superior to those of other carriers.

"In the new blend of Megasul, the small, active particle size of Nitrophenide is retained, but is blended with the citrus meal, a coarser carrier than previously used," American Cyanamid

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Many years a favorite source of soluble magnesia for Florida soils. Used extensively in fertilizer mixtures for citrus crops and vegetables. Especially useful and economical for direct application where only magnesia is required.

Florida growers now consider magnesium a primary plant food in the same category with nitrogen, phosphorus and potash.

The recommendations of the Florida Citrus Experiment Station at Lake Alfred, published in January 1954, stress the need for large application of magnesium for Citrus in soluble form and state that it is usually applied as a Sulphate.

Ask your fertilizer manufacturer for EMJEO, long a dependable source of this key plant food.

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Company reported. "It is then specially treated to seal the active drug particles into the porous flakes of the carrier, thus overcoming the problem of separation of Nitrophenide from the carrier in handling and shipping. The new Megasul is a non-dusting, non-caking, non-bridging, uniform and free-flowing product."

Megasul Nitrophenide, which is effective against all types of coccidiosis, was discovered and developed by Cyanamid research scientists and made available to the feed industry in 1949. In addition to preventing outbreaks of both cecal and intestinal coccidiosis, the preparation is recommended for continuous feeding of birds during the first 12 weeks of life to promote faster and more uniform growth, increasing feed efficiency and general well-being, the manufacturers said.

USDA PURCHASES 129,565 CASES OF CONCENTRATE ORANGE JUICE IN FLORIDA

The U. S. Department of Agriculture has announced the purchase of 129,565 cases of 12 No. 3 cylinder cans of concentrate orange juice at an average cost of $6.98 per case, f. o. b. processors' plants. Purchases were made under Section 6 of the National School Lunch Act of 1946.

This concentrated orange juice, all from Florida processors, will be delivered during the period January 10 through February 12 to schools participating in the National School Lunch Program.

These acceptances, which complete the purchase of this product, were made pursuant to purchase specifications mailed to concentrate processors on December 8, 1954.

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FLORIDA CITRUS COMMISSION TECHNICIANS RECOGNIZED

Four members of the Florida Citrus Commission's research department are among 13 technicians who have been recognized as having made the most significant contributions to the development of frozen orange juice concentrate, Food Processing Magazine has announced in its December issue.

Designated as "Food Frontiersmen" of frozen orange juice concentrate, according to Howard P. Milleville, editor of the magazine, were Dr. L. G. MacDowell, Citrus Commission research director; Dr. E. L. Moore, C. D. Atkins, and Eunice Wiederhold Moore.

Others honored were B. C. Skinner, Dunedin; H. S. Madsen, Lakeland; A. L. Stahl, Joe Cross, J. J. R. Bristow, J. L. Heid, Charles Kaufman, R. H. Cotton, and the late Norman V. Hayes.

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A SURVEY ON RECOVERY OF CITRUS GLUCOSIDES

(Continued from page 10)

extraction procedure for hesperidin, Duncan grapefruit peel was extracted with the following modifications: lime was added to maintain an extraction pH of 9.2, the extraction was partially neutralized prior to processing and finally adjusted to a pH of 4.0 for crystallization and the naringin was isolated by filtration after 18 lbs. of storage time without any prior heating. Two runs were made each month, the second run being made to determine the effectiveness of recycling the extraction liquor.

Table 1. The Chemical Requirements and Processing Data Obtained in the Monthly Extraction of 4,000 Grams of Orange Peel

Variety	Date	Ca(OH)2 g. Used	Conc. HCl ml. Used	Total Wt. Press Juice g.	Juice Brix	Juice % Acid
Parson Brown	Sept. 8	60	41	8411	8.25	1.34
" "	Sept. 29	54	35	8581	8.30	.93
" "	Nov. 13	53	39	8540	9.5	.73
" "	Dec. 7	53	44	8460	9.8	.64
" "	Jan. 11	57	48	8398	11.2	.57
" "	Feb. 8	60	46	8173	12.3	.48
Pineapple	Sept. 8	60	39	8267	8.1	1.51
"	Sept. 9*	75	56	8503	8.1	1.51
"	Oct. 12	50	34	8320	8.3	1.08
"	Oct. 13*	61	51	8580	8.3	1.08
"	Nov. 9	59	40	8190	10.4	.98
"	Nov. 10*	76	61.5	8418	10.4	.98
"	Dec. 7	57	41.5	8235	10.9	.89
"	Dec. 7*	77	69	8568	10.9	.89
"	Jan. 11	71	60	8025	11.4	.81
"	Jan. 11*	76	71	8448	11.4	.81
"	Feb. 8	65	47	8082	11.2	.76
"	Feb. 9*	79	72	8500	11.2	.76
"	Mar. 8	57	41	8175	12.0	.73
"	Mar. 9*	78	75	8578	12.0	.73
Valencia	Sept. 8	75	43	8304	7.8	2.76
"	Sept. 29	64	40	8500	7.5	2.36
"	Nov. 12	60	39	8288	8.5	1.72
"	Nov. 12	62	38.5	8298	8.5	1.72
"	Nov. 13	63	42	8298	8.5	1.72
"	Dec. 7	59	41	8235	9.2	1.52
"	Jan. 11	59	48	8448	9.6	1.21
"	Feb. 9	64	44	8110	10.4	1.10
"	Mar. 9	64	44	8343	11.1	.98
"	Apr. 6	66	44	8028	11.3	.92
"	May 24	60	43.5	7108	11.7	.73

* Recycled hesperidin extraction filtrate.

The results of this investigation, shown in Fig. 3, can be summarized as follows: The maximum yield of 13 lbs. of naringin per ton of Duncan peel extracted was obtained early in the season. In extracting naringin there was found to be an advantage in recycling the mother-liquor at certain times of the year. The tendency of naringin solutions to remain in a supersaturated state was a troublesome factor, and although certain remedies were tried the trouble was not eliminated. Since naringin is fairly soluble in water, the extraction was not readily influenced by the size to which the peel was cut.

Insert Fig. No. 3

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FAIRCHILD'S WORK CHANGED FACE OF AMERICA'S GARDENS

"I have always liked horticulturists, people who make their living from orchards and gardens, whose hands are familiar with the feel of bark, whose eyes are trained to distinguish the different varieties . . . "Their brains are not forever dealing with vague abstractions; they are satisfied with the romance which the seasons bring to them. They have the patience and fortitude to gamble their lives and fortunes in an industry which requires infinite patience, which raises hopes each spring and too often dashes them in the fall."

Thus spoke Dr. David Fairchild in his eloquent book, "The World Was My Garden." He spoke after 60 years of untiring travel and research, hunting new plants in every corner of the world, to improve America's agriculture and to beautify its gardens and countryside.

Lifted Farm Economy

He was remarkably successful in his search. As founder and director of the office of plant introduction of the Department of Agriculture, he was responsible for bringing some 100,000 new plants into the United States. Through his efforts the nation's farm income was increased by at least $100,000,000 a year.

Last August 4, while Dr. Fairchild was tending his own beautiful tropical garden on Biscayne Bay at Coconut Grove, Florida, he collapsed and two days later he died, in his 85th year.

Dr. Fairchild's home and gardens in South Florida were a loadstone for young plant prospectors and geneticists. They came from all over the world for instruction and inspiration.

In his semi-retirement of recent years, there was time for Dr. Fairchild to observe the fruits of his labors — how the soy bean, the tung

(Continued on page 22)

Groves For Sale

23.7-A. 2400 Hamlin Orange Trees

BELL grove on U. S. 41, 11 mi. S. of bridge at Ruskin. 13.7 A. across hwy. from Red Top groc. & Amoco gas sta. 10 A. ½ mi. N. of Red Top Groc. on E. side of U. S. 41. Hamlin org. 12-15 yr. Sour root, dbl. set. A-1 cond. Good crop incl. Barg. $33,000. $16,000 dn., bal. over 1-4 yrs. @ 5%.

60-A. Irrig. Grove, $70,000

$30,000 dn. Bal. 4 yrs. 5%. Prod. approx. 30,000 bxs. yr. Tenant hse. barn, well, pump, motor, irrig. pipe. 900 M GF. 1025 Duncan GF. 192 Hamlin or., 76 Tang., 47 P. Brown org., 47 Val. org., all 25 yrs. 531 Hamlin org., 7 yrs., 125 pink GF. 95 vacats. 3 sour org., total 3020 trees. A-1 cond. Just fertz. disc. 12 mi. of Tampa. Fruit incl.

40-A. A-1 Valencia Orange Grove

FEW mi. north of Tampa, 12 yrs. old. Crop incl. Fertz., disc. $78,750 cash. Insurance Co. will put mtg. on it.

10-A. Valencia Orange Grove, $15,000

7 mi. N. of Lakeland Ext. of N. Fla. Ave. Turn W. at Pure Oil gas sta. at Duff Rd. 1 mi. to 1st grv. on right next to white house. 482 25-yr. Val. 221 2-yr. Val. Total 703 trees, just fert. disc. hoe'd. good crop. $10,000 dn, $1000 yr. 6% int.

10-A. Grove, $16,500

NR. Tampa approx. 650 trees, A-1 cond. 12 yrs. old, 2/3 early orgs., 1/3 March GF, good crop incl. $5000 dn., $2000 yr. incl. 6%.

Frank Whealton, Broker

2744 Florida Ave.—Ph. 2-9631. Res. 49-1372

Tampa, Florida

Florida Citrus Commission Aids Nutritional Research

Nutritional research, a little known but highly important activity of the Florida Citrus Commission, is yielding a mass of information which promises to contribute much to the health of the nation, as well as assist the Florida citrus industry in marketing an ever-increasing citrus crop.

Since the establishment of its research department under the direction of Dr. L. G. MacDowell in 1942, the Commission has financed study projects by more than 25 scientists in fields ranging from geriatrics—the problems of our elderly population—to pediatrics—the problems of infants and children.

Working closely with the Commission's medical advertising and publicity agency, Noyes and Sproul, Inc. of New York, the research department keeps track of the many nutritional research projects being conducted each year throughout the country.

Whenever one is found that promises to provide information on the relation of citrus fruits and juices to health and diseases, the Commission attempts to provide financial assistance to the scientist, so that he may carry out his studies as thoroughly as possible.

In other instances, the Commission will provide a grant-in-aid to some scientist outstanding in his field to carry out research work on some particular problem concerning citrus in which the Commission is interested.

One of the most productive research projects carried out with the financial backing of the Commission in recent years was the work of Dr. Carl T. Javert, of the Cornell University Medical College.

Dr. Javert's study covered nearly 2000 women who had previously lost one or more babies during pregnancy. His treatment included a diet rich in citrus fruits—about four large glasses of orange juice daily—with supplements of synthetic Vitamins C and K.

One hundred of Dr. Javert's patients, with an average of four lost babies each, were placed on the new regime and 91 became mothers successfully. Some have since had two or more children, for a total of 124 babies in all.

A vast amount of national publicity

WARNING

Dream Navel Orange

is a Patented variety and NONE can propagate this variety EVEN AFTER BUYING NURSERY STOCK which does NOT give the purchaser any such rights. Purchasers of these trees or budwood, or grafts can be prosecuted for buying or accepting free any Dream Navel Orange propagation material and must only obtain this patented material from authorized Nurseries which are:

GLEN SAINT MARY NURSERIES
GRAND ISLAND NURSERIES
GEORGE B. JEWETT, NURSERYMAN
AND
ROYAL PURPLE CITRUS RESEARCH NURSERIES

Anyone disregarding Patent Rights will be vigorously prosecuted for infringement.

ROYAL PURPLE CITRUS RESEARCH NURSERY
Donald J. Nicholson, Sole Owner

Florida's Greatest Annual Attraction

In celebration of its Golden Anniversary, the Florida State Fair will be bigger, better, more exciting and more entertaining than anytime in its 50-year-old history!

In addition to hundreds of exhibits and other annual features, many special events are planned. Colorful ceremonies will pay tribute to Tampa's Centennial Year and the 50th Anniversary of Rotary International . . . A Big Home Craftsman Show will feature Do-It-Yourself items . . . The 9th Annual Florida Electrical Exposition will be more elaborate than ever . . . "Florida Calling" will be broadcast daily from the fairgrounds . . . The county exhibits and displays of agricultural products and equipment will be of special interest to Florida grove owners.

The spectacular Gasparilla Pirate Celebration, parades, grandstand attractions, fun-packed midway, auto races and thrill shows will highlight 15 days of exciting entertainment.

Make your plans now to attend the Florida State Fair in Tampa on its Golden Anniversary!

Special Agricultural Events

FEB. 5. West Coast Dairy Show. Dairy Breeding Show opens.

FEB. 8 Parade of Dairy Champions. Presentation of Livestock Champion Awards.

FEB. 9 Ayrshire Sale.

FEB. 10 Fat Steer Show opens.

FEB. 11 Fat Steer Sale.

FEB. 12 Future Farmers Day.

FEB. 14 Swine Breeding Show opens.

FEB. 15 & 16 Second Annual Poultry Winter Program.

FEB. 17 Parade of Beef Champions. Presentation Livestock Champion Awards.

FEB. 18 Second Annual Pan American Brahman Sale.

FEB. 19 4-H Club and Flying Farmers Day.

be in TAMPA at Fair time!

ADVERTISEMENT — LYONS FERTILIZER COMPANY

The LYONIZER

COMPILED BY THE LYONS FERTILIZER COMPANY

Reports Of Our Field Men . . .

SOUTHWEST FLORIDA
Eaves Allison

Some citrus growers in this area have given up waiting for a higher price on the tree and have taken what the market offered. Others are still holding in the expectation that a reduced crop estimate will up the on-the-tree buying price. Common grapefruit seems to be static as this time (Jan. 15th) at 50c on the tree. Citrus quality now is high. Some bloom is showing up now also. Growing conditions are good with no cold damage observed.

Fall vegetable crops with few exceptions were below expectations in monetary returns. However, the picture is better than last year as most growers will get back their cost outlay. Even with a much reduced fall truck acreage prices were disappointing. Dependence is now falling on the Spring deal for eating money!

Gladiolu growers have fared better than last year, and altho the flower cut was retarded by cold weather general satisfaction is expressed by the growers.

No extensive cold damage in this area to date, tho we have had some close calls.

HIGHLANDS AND POLK
J. K. Enzor, Jr. & R. E. Lassiter, Jr.

Early in January there was notice that purple mites were beginning to come up in very large numbers. Growers should pay particular attention to this insect and spray accordingly.

By the middle of January considerable new growth has appeared and we have observed quite a bit of pinpoint bloom. The cold weather on the night of January 13th and 14th caused considerable damage to this growth in cold spots.

Growers in this area are beginning to apply their spring fertilizer application. In spots where the growth has already appeared the top dresser should be applied.

The movement of fruit has been very sluggish over the past month and the price being offerer has been very unsatisfactory as far as the growers are concerned. There is still considerable optimism among the growers in this area that the on-tree price will be better.

NORTH CENTRAL FLORIDA
V. E. Bourland

Weather conditions have been cool and dry. Most all growers are through with fertilizing, their biggest worry now is the fruit price which is very unsatisfactory, and they don't know whether to hold midseason fruit for better price or go ahead and have it moved, most of them figure the federal estimate is much too high, and they realize valencia crop is light.

Red spider or purple mite is still bad in some groves which is keeping growers on a close watch.

Some groves are already showing buds swelling.

V. E. Bourland

EAST HILLSBOROUGH AND PASCO COUNTIES
E. A. McCartney

We had a very welcome rain Sunday night, the 16th, as much as one inch in some places; this helped a lot as it was getting dry. Citrus trees have responded nicely, looking much better. Vegetables took a beating in most sections just a few nights before the rain. Plant City section was hard hit, a low of 27° was recorded. Berry and pepper crops, beans, and other tender plants will be set back if not destroyed completely.

Some damage to young citrus trees in low pockets. I have not found any damage to fruit. Red spider has shown up. Some groves have a bad infestation of rust mite. We are getting ready for the post bloom spray; it will be underway when this is published.

Fruit prices are far from being satisfactory to the growers. The ones that sold for $1.00 per box on the tree seem to have hit the high price as 75c to 85c is all that is being paid, as of this date. Grapefruit 35c to 45c per box when they can find a buyer. Early action on Valencia oranges that I know of. One customer was offered a $1.10 on the tree; another a $1.25 to be moved by March 15. Some deal!

At this time we are in between late fall and early spring fertilizing. Activities are mostly directed to checking groves and answering the always present question what do you hear about fruit prices?

SOUTH POLK, HIGHLANDS, HARDEE AND DESOTO COUNTIES
C. R. Wingfield

After two weeks of beautiful weather the winds began to blow and on them rode a cold wave that was a surprise.

The temperatures dropped to 28 degrees on high land levels and a heavy frost blanketed the area. Citrus escaped with very little damage but the vegetables took a heavy toll. As far as can be determined there was no fruit that was hurt unless there was some to tangerines in low areas. There appears to be some scorched leaves that can be confined to young trees. In the vegetable field there was not too much left from the late December frost but some plantings were up and if not covered with sand from the winds it became frosted.

Orange movements have been heavy but from all indications we are behind last years pickings. Prices have been rather uncertain but the last few days it has shown a little improvement. Groves are looking to be in good condition and around the 15th there was some indication of blooming. The weather will be a factor as to whether it comes on or stays at this point. There is some worry attached to this point so we can hope for the best.

C. R. Wingfield

LYONS
FERTILIZERS
PRODUCE
MAXIMUM CROPS
OF
HIGHEST QUALITY

ADVERTISEMENT — LYONS FERTILIZER COMPANY

Uncle Bill Says:

Seems as how 'bout this time of the year they is fairs of different kinds all over the state of Florida . . . big fairs and little fairs . . . but everyone of 'em regardless of size bases their shows mostly on what Florida produces in the way of fruits and vegetables . . . which is right proper 'cording to our book, 'cause after all they ain't no place else in all this great country of ours that provides folks all over the nation and in many foreign countries with the good things to eat that we raise right here in our home state.

So we have every right to feel plumb proud of our produce . . . including the fine beef and pork that is now bein' raised on the improved pasture land which is gettin' to be the rule rather than the exception in our state now-a-days . . . and it is jist natural that the folks who run our fairs should want to base the foundation of these fine shows upon what Florida raises right here at home.

They ain't no other state we know of that raises so much of so many different kinds of good eatin' than Florida . . . which fact coupled with our wonderful sunshine and generally fair climate is probably the reason that folks look so healthy and live so long on an average, in Florida.

We ain't about to cast off on no other state or section but fer our money when we chose Florida as our home we feel that we made the smartest deal we ever made . . . and judgin' from the way this state is growin' and the great number of folks that's comin' to Florida from other sections of the country to make their homes in Florida we ain't the only ones who have found Florida the very best state in the nation in which to live.

Bein' a citrus grower ourself we appreciate what good, top-quality fruit means . . . and jist so long as we kin git good Lyons Fertilizer to feed our grove we know that we'll keep right on raisin' the best citrus fruit that kin be raised.

XUM

on Dr. Javert's findings was printed in a number of widely circulated magazines as well as in several medical journals, thus giving new hope to thousands of childless familes.

The importance of citrus Vitamin C in the diet of teen-age children was emphasized in the findings of Dr. Pauline Beery Mack, nutritionist and dean of Texas State College for Women, who made a survey on the food intake of 2550 children and teen-agers and 2200 adults.

"The property which orange juice has of providing fatigue resistance, coupled with its excellent provision of Vitamin C, recommends this beverage not only as a meal-time but also as a between-meal food," Dr. Mack stated in her report which has also been widely publicised in the medical and lay press.

Proof that elderly people also benefit from an increased intake of citrus juices was found in a Commission research project carried out by Drs. Leo J. Cass, William S. Frederik and J. D. Cohen at Long Island Hospital, Boston.

Patients with arthritis experienced "a significant decrease in pain" on a high Vitamin C intake, the scientists reported. Vitamin C, or aspirin, or the two together, appeared to increase appetite, well being and mobility, and to decrease pain, the investigators found, adding that aspirin affected pain favorably, but addition of Vitamin C daily increased its beneficial effect.

The Cass-Frederik-Cohen study, reported in the August issue of Geriatrics magazine, also indicated that patients with multiple sclerosis who were treated with large doses of Vitamin C showed "subjective and objective improvement warranting further investigation."

A group of patients with chronic acne, one of the most common causes of skin blemishes, showed "dramatic improvement shortly after the adminstraition of Vitamin C and citrus juices without change in the previous method of treatment," Dr. George E. Morris, assistant clinical professor of dermatology at Tufts College Medical School, found after a four-month study of 53 patients who were given an eight-ounce glass of citrus juice daily and Vitamin C supplements.

Forty-three of the 53 patients showed improvement, Dr. Horris stated, but the most interesting were 15 patients whom he had observed for some time prior to the study or who had been treated elsewhere without improvement. With these 15 patients, "the adminstration of Vitamin C seemed to improve them more than any other mode of treatment they received," he reported.

Through periodic publicity releases by Noyes and Sproul to more than 1000 science writers, editors, columnists, and other interested sources, and through a continuous advertising program in a large number of professional journals, the Commission is spreading the news of these technical findings which point up the healthful benefits contained in Florida citrus fruits and juices.

"Our nutritional research program," says Dr. MacDowell, "must of necessity be a gradual and thorough process, but its results can well mean a better life for many millions of people throughout the nation."

Empty butter cartons are handy for molding cookie dough that is to be stored in a refrigerator and chilled.

Help Yourself to Health!

HOT SPRINGS
NATIONAL PARK, ARKANSAS

Health and happiness are always in season—and there's no better place to give them a boost than Hot Springs!

A staff of expert attendants is maintained in the Majestic Hotel Bath Department. Under their skilled treatment, you will find glowing health and contentment replace aches, tension and worries.

And remember, our Bath House is operated in accordance with regulations prescribed by the National Park Service of the U. S. Government's Department of the Interior.

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BATHS COTTAGES

Excellent outdoor recreational and sports facilities are maintained for the exclusive use of Majestic Hotel guests.

Write today for further information

FAIRCHILD'S WIRK CHANGED FACE OF AMERICA'S GARDENS

(Continued from page 18)

nut tree, the date palm, the avocado, the Persian melon, disease resistant sugar cane and wheat, and long-staple cotton, to name a few, have changed and enhanced the agriculture of his country.

Other plants of Dr. Fairchild's introduction were "merely beautiful", like the 300 kinds of palms and the 15,000 orchids of the public Fairchild Tropical Garlens—named in his honor—below Miami.

Instead of keeping a linen tape measure loose in your sewing basket, wrap it around an empty adhesive-tape spool and then fasten the tape spool cover in place.

Approximately one thousand persons attended the recently held horticultural clinic at Daytona Beach, accord-to an estimate by County Agent T. R. Townsend.

Canning of citrus in Florida began in 1914.

Classified Ads

CITRUS SEED

New crop Rough Lemon, Sour Orange and Cleo seed now available. Price $3.50 per quart for Sour Orange, $10.00 per quart for Rough Lemon and Cleo Seed. Freshly extracted and shade dried.

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FOR SALE — Limited number of Our Improved Jewel Peach Trees on Nematode Resistant Stock. CLAY HILL NURSERIES COMPANY, Box 2880, Tampa, Florida.

SUPERIOR CITRUS TREES — Now booking orders for 100,000 trees for Winter and Spring delivery. Don't be caught short — place your order now. For quotation call us, 2-7541 or write.
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PERSIAN LIME TREES — Ready for delivery. Other popular varieties all on rough lemon root, for delivery now or January, 1955.
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FOR SALE

Several thousand Parson Browns on Sour Root Stock, 1" to 1½" caliper. Also have Navels, Pineapples, Dancy Tangerines, Valencias, Murcoits — Pretty Trees. Contact J. EDWIN CAUTHEN, P. O. Box 342, Leesburg, Florida.

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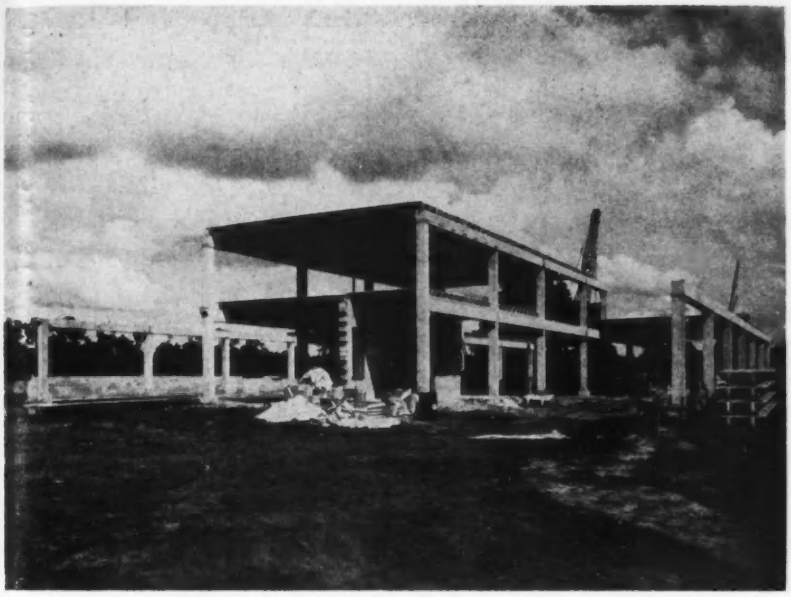

T. G. LEE DAIRY under construction in Orlando. Roof slabs, floor slabs, beams, and columns are all prestressed precast concrete . . . furnished by Holloway Concrete Products Co., of Winter Park, Fla. Charles Johnson, Architect . . E. M. Scott, Contractor . . . Lakeland Engineering Associates, Inc., Prestressing Consultants. Double Tee roof spans vary from 36 to 40 feet. The beams and columns are hollow. Of special interest is the two-story column cast in one piece.

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It's Difficult To Make A Positive Forecast . . .

Because even the most astute forecaster may have trouble in figuring out the answer to situations over which man has no control . . . so whether you may be trying to figure out just what the weather is going to do, what the market may develop into, or what the Chinese communists may do, there is always a chance that even the most expert figuring may be off a bit.

On the other hand most any of us can look back over the years when conditions were similar to those which exist right now and come right close to making a pretty accurate diagnosis of what the immediate future may mean to us.

One thing is certain . . . in spite of all the problems and complexities which the Florida grower has to face from year to year . . . it is safe to predict that few industries, on an average, offer a more attractive outlook than that which faces Florida growers.

As the most productive of all citrus and vegetable growing sections our state furnishes citrus fruit and vegetables which serve a large part of this nation.

And when we growers see to it that the crops we produce are tops in quality we need have no fear that any other section will take away our market . . . this fact is recognized by those engaged in citrus and vegetable production in this state as is evidenced by the care which we give our trees and crops.

Nothing helps to carry out this program of Quality production more effectively than proper fertilization . . . and a great many of the most successful growers in Florida will attest to the fact that Lyons Fertilizers provide the most effective results in producing High Quality and Maximum Crop production.

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